warnings were issued for the cranberry marshes of Wisconsin on the 1st, and 10th to 13th, and also for the northern portion of the district on the 20th. The warnings were timely and accurate, and no frost occurred without warnings.—*H. J. Cox, Professor and District Forecaster.*

DENVER FORECAST DISTRICT.

Over the greater portion of the Rocky Mountain districts the month was colder than usual, with several prolonged periods of low temperature. No special warnings were issued or needed. Owing to a rapid melting of snow near the Continental Divide the Grand River and streams rising in the San Juan Mountains, in the southwestern part of Colorado, were at flood stage during a part of the second decade of the month. No great damage resulted.—*F. H. Brandenburg, District Forecaster.*

SAN FRANCISCO FORECAST DISTRICT.

The month was unusually rainy. In the last fifty-seven years the rainfall in June in San Francisco has exceeded that of the present season only four times. On the 2d southeast storm warnings were displayed along the coast from Fort Harford north. This is the first time in the knowledge of the observer that warnings have been displayed in June. Rain fell generally in northern California, with high southerly winds. Throughout the month there was a tendency for north coast lows to extend southeast over Nevada, with a circulation more or less sluggish. The north Pacific seasonal high seems to have extended but little east of the coast line and apparently retreated somewhat west of its usual position. An excellent illustration of the result of such a pressure distribution is shown on June 10 and 11, and again on June 14 and 15. The month was singularly free from intense or prolonged hot spells.—*A. G. McAdie, Professor and District Forecaster.*

PORTLAND, OREG., FORECAST DISTRICT.

The month was unusually wet and the temperature averaged below the normal. Storm warnings ordered on the 3d and 11th were fully justified. Several light frosts occurred east of the Cascade Mountains for which, as a rule, timely warnings were issued. The Columbia River rose slowly during the entire month, but did not reach a flood stage at any point in this district.—*E. A. Beals, District Forecaster.*

RIVERS AND FLOODS.

There were no high waters of great consequence during the month in the rivers on which river and flood service is maintained. The heavy rains of the early portion of the month in eastern Kansas, southwestern Missouri, and Arkansas caused flood stages in a considerable portion of the Neosho River, and comparatively high stages in the lower Arkansas River. The Missouri River was quite high from Bismarck southward, but did not reach flood stages. The crest of the rise passed Wolfpoint, Mont., on the 9th, Bismarck on the 11th, Sioux City on the 16th, Omaha on the 18th, Kansas City on the 21st, and Hermann, Mo., on the 24th, showing at St. Louis on the Mississippi River on the 25th. In the Mississippi River the stages were about normal for the season.

There was a sharp rise in the Brazos River of Texas from the 1st to the 9th, but the crest stages were from 4 to 17 feet below the flood stages. The Trinity River was also high at the same time, and the stages varied from 5 to 14 feet above the flood stages, except over the extreme lower portion of the river. Warnings and advices were issued for both rivers, beginning on May 31.

The Columbia River fell steadily throughout the month.

The highest and lowest water, mean stage, and monthly range at 285 river stations are given in Table VI. Hydrographs for typical points on seven principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Professor of Meteorology.*

NOTE.—The term, "danger line", will no longer be used in designating the overflow stages of rivers. As a substitute the words "flood stage" will be used, the term meaning the lowest stage of water at which overflow will begin.

THE WEATHER OF THE MONTH.

By Mr. P. C. DAY, Assistant Chief, Division of Meteorological Records.

PRESSURE.

The distribution of mean atmospheric pressure is graphically shown on Chart VI, and the average values and departures from normal are shown in Tables I and V.

The pressure during June, 1906, was low over all parts of the United States and Canada, except over a small area embracing the northern Rocky Mountain districts and extending southwest over Nevada and California and west over Oregon and Washington to the Cascade Mountains, where the pressure was slightly above normal.

The high pressure area with averages above 30.00 inches normally overlying the South Atlantic and East Gulf States and extending eastward into the Atlantic, was much reduced in intensity during the current month, falling considerably below 30.00 inches.

Pressure much below the normal prevailed throughout the Lake region and extended far to the northwestward over Manitoba, Alberta, and the Saskatchewan districts of Canada. At Prince Albert, Saskatchewan, the pressure averaged 0.15 inch below the normal.

Over the Pacific coast and southern Rocky Mountain districts the pressure distribution was not materially different from the average.

The normal change in pressure from May to June shows a large area from western Texas northeastward to the Lakes and eastward to the Atlantic, with a considerable increase in pressure. North and west of this region there is a general decrease in pressure from May.

During the current month nearly all sections showed marked decreases in pressure from the values for May, 1906, and especially from the Gulf coast northward to the Lakes and northwestward over Canada. Over a small region embracing Oregon and Washington, and extending eastward as far as Colorado, the pressure for June was slightly above that for the preceding month. The marked decrease of pressure northward brought nearly all districts east of the Rocky Mountains under the influence of southerly winds and confined the storm tracks, as a rule, well to the north.

TEMPERATURE.

The mean temperature for the month over the greater portion of the interior of the United States was well below the average. Over the greater part of the western plains and mountain region and extending almost to the Pacific coast, the temperature averaged from 2° to 4° below normal. Over the Great Valley of California temperatures were again well below the average, Red Bluff, Cal., showing an average deficiency of more than 5° daily. Over the Lake region, Atlantic and Gulf States, the Rio Grande Valley, and the south Pacific coast the temperature was generally in excess of the average. Maximum temperatures, as a rule, were not excessive, but few points showing as high as 100°, except over western Texas, the southern parts of New Mexico and Arizona, and the interior of southern California. Maximum temperatures of 110° were recorded at a few points in the desert regions of southwestern Arizona and southeastern California. Temperatures below freezing were not recorded, except over extreme northern

New England, in the Adirondack region of New York, and over the elevated sections of the Rocky and Sierra Nevada mountains.

In Canada.—Prof. R. F. Stupart says:

The temperature was above the average in all portions of the Dominion, except over the mainland of British Columbia and the larger portion of the Maritime Provinces. The positive departures, however, nowhere exceeded 2° or 3° or the negative departures 2°.

PRECIPITATION.

The precipitation was generally in excess of the average from the Lake region eastward to the coast and south to the Gulf; also along the entire northern border and generally over the north Pacific coast region. There was an excess also over parts of central and northern Texas, southwestern Missouri and eastern Kansas. The amount of fall over the lower Mississippi and Missouri valleys, over the southern part of Texas, and generally over the mountain and plateau districts was considerably below the average. In all sections, except Arizona and New Mexico, where a severe drought prevailed, the rainfall was well distributed throughout the month and even in the sections with deficient amounts the frequent showers prevented any serious damage to growing vegetation. Rains phenomenally heavy for the region occurred in the northeastern counties of Montana on June 6 and 7, causing local floods in the Milk River and other tributaries of the Missouri River in that section of the State with heavy loss of stock and damage to farms and bridges. At Warwick in the above district over 13 inches of rain fell from the 6th to the 8th.

Snow occurred at numerous points in the central Rocky Mountain region, in amounts ranging from a trace to as much as 15 inches.

In Canada.—Prof. R. F. Stupart says:

The month was remarkable for the excessive rainfall which occurred over a large portion of the Dominion, especially in Saskatchewan, Manitoba, and Ontario, and locally in Quebec and the Maritime Provinces. Considering the conditions in Provinces separately, the average was exceeded in some localities in British Columbia, whereas in others it was not maintained. In Alberta a negative departure appears to have been general. In Saskatchewan, Swift Current reported four and a half inches above the usual amount. In Manitoba it was from two to three inches above the average. Over the larger portion of Ontario it was from three up to as much as six inches in excess of the average. In the extreme western part of Quebec it was three-quarters inch to two inches above, but in the Province generally about an inch below the average. In the Maritime Provinces, it was two to three and a half inches above in Prince Edward and Cape Breton islands, while elsewhere, as a rule, it was not up to the average. Halifax recorded a negative departure of two and a quarter inches, Sussex two inches, and Yarmouth one inch.

The average and extreme values of the principal climatological data are given for each station in Tables I–VI, but the averages by districts are summarized in the following tables:

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	9	62.8	— 0.7	+ 4.2	+ 0.7
Middle Atlantic	13	71.8	+ 0.8	+ 6.0	+ 1.0
South Atlantic	10	77.7	+ 0.9	+ 0.4	+ 0.1
Florida Peninsula*	8	80.8	— 1.0	— 0.6	— 0.1
East Gulf	8	79.8	+ 1.4	— 6.8	— 1.1
West Gulf	7	80.1	+ 0.9	— 2.5	— 0.4
Ohio Valley and Tennessee	12	73.2	— 0.2	— 0.9	— 0.2
Lower Lake	8	67.2	+ 0.1	+ 6.0	+ 1.0
Upper Lake	10	63.2	+ 0.5	+10.2	+ 1.7
North Dakota*	8	62.3	0.0	+14.6	+ 2.4
Upper Mississippi Valley	13	69.2	— 1.6	+ 2.9	+ 0.5
Missouri Valley	11	68.9	— 1.7	+ 9.4	+ 1.6
Northern Slope	7	60.2	— 2.8	+ 7.9	+ 1.3
Middle Slope	6	70.3	— 1.2	+ 4.4	+ 0.7
Southern Slope*	6	75.2	— 0.8	— 4.2	— 0.7
Southern Plateau*	13	72.8	— 0.8	+ 3.4	+ 0.6
Middle Plateau*	8	61.1	— 3.4	0.0	0.0
Northern Plateau*	12	58.3	— 2.3	+ 5.9	+ 1.0
North Pacific	7	56.5	— 1.1	+ 7.3	+ 1.2
Middle Pacific	5	61.1	— 0.8	+ 8.4	+ 1.4
South Pacific	4	66.5	0.0	+ 3.8	+ 0.6

* Regular Weather Bureau and selected cooperative stations.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		*Inches.*	*Inches.*
New England	9	3.86	126	+0.8	+0.6
Middle Atlantic	13	4.40	119	+0.7	—1.9
South Atlantic	10	6.79	139	+1.9	—1.4
Florida Peninsula*	8	7.91	113	+0.9	+4.8
East Gulf	8	4.05	82	—0.9	—5.2
West Gulf	7	2.85	76	—0.9	—7.2
Ohio Valley and Tennessee	12	4.07	93	—0.3	- 6.4
Lower Lake	8	3.45	95	—0.2	—5.0
Upper Lake	10	3.46	92	—0.3	—1.5
North Dakota*	8	3.87	130	+0.9	+2.8
Upper Mississippi Valley	13	3.34	74	—1.2	—1.1
Missouri Valley	11	3.55	82	—0.8	—1.4
Northern Slope	7	2.20	85	—0.4	+0.8
Middle Slope	6	2.05	69	—0.9	—2.4
Southern Slope*	6	3.06	97	—0.1	—0.2
Southern Plateau*	13	0.08	21	—0.3	+1.7
Middle Plateau*	8	0.43	81	—0.1	+3.4
Northern Plateau*	12	1.48	100	0.0	+0.2
North Pacific	7	3.14	147	+1.0	—6.8
Middle Pacific	5	0.88	183	+0.4	+4.7
South Pacific	4	0.05	100	0.0	+6.4

*Regular Weather Bureau and selected cooperative stations.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	79	0	Missouri Valley	65	— 2
Middle Atlantic	77	+ 4	Northern Slope	62	+ 5
South Atlantic	80	+ 2	Middle Slope	60	0
Florida Peninsula	80	0	Southern Slope	56	— 4
East Gulf	73	— 2	Southern Plateau	28	— 2
West Gulf	73	— 3	Middle Plateau	41	+ 4
Ohio Valley and Tennessee	73	+ 3	Northern Plateau	56	+ 5
Lower Lake	73	+ 2	North Pacific	77	+ 1
Upper Lake	76	+ 3	Middle Pacific	69	+ 7
North Dakota	75	+ 7	South Pacific	66	+ 1
Upper Mississippi Valley	70	0			

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.5	+ 0.4	Missouri Valley	4.7	— 0.1
Middle Atlantic	5.7	+ 0.7	Northern Slope	4.8	0.0
South Atlantic	5.3	+ 0.4	Middle Slope	4.2	+ 0.5
Florida Peninsula	4.9	— 0.5	Southern Slope	3.4	— 1.0
East Gulf	4.7	— 0.1	Southern Plateau	1.5	— 0.4
West Gulf	3.9	— 0.7	Middle Plateau	3.0	0.0
Ohio Valley and Tennessee	5.4	+ 0.4	Northern Plateau	4.7	— 0.4
Lower Lake	5.3	+ 0.4	North Pacific	6.5	+ 0.4
Upper Lake	5.3	+ 0.1	Middle Pacific	4.4	+ 1.2
North Dakota	5.5	+ 0.3	South Pacific	2.6	— 0.7
Upper Mississippi Valley	5.0	0.0			

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Abilene, Tex	24	52	w.	North Head, Wash	11	74	se.
Bismarck, N. Dak	7	54	w.	Do	12	50	se.
Buffalo, N. Y	8	55	nw.	North Platte, Nebr	27	50	sw.
Chattanooga, Tenn	25	50	w.	Omaha, Nebr	30	52	n.
Cheyenne, Wyo	6	59	w.	Philadelphia, Pa	30	54	nw.
Do	7	55	w.	Pierre, S. Dak	27	53	sw.
Chicago, Ill	29	56	nw.	Point Reyes Light, Cal	12	54	nw.
Columbus, Ohio	5	57	sw.	Do	13	51	nw.
Corpus Christi, Tex	11	62	n.	Do	20	50	nw.
Dodge, Kans	26	50	nw.	Do	21	67	nw.
Havre, Mont	12	74	w.	Do	25	56	nw.
Lewiston, Idaho	21	50	sw.	Do	26	53	nw.
Lexington, Ky	5	50	sw.	Do	28	52	nw.
Memphis, Tenn	25	60	nw.	Do	29	57	nw.
Modena, Utah	5	60	sw.	Saint Paul, Minn	6	50	s.
Mount Tamalpais, Cal	14	54	nw.	Sand Key, Fla	9	56	ne.
Do	20	59	nw.	Do	16	70	ne.
Do	21	60	nw.	Southeast Farallon, Cal	21	53	nw.
Do	25	61	nw.	Topeka, Kans	22	58	nw.
New Orleans, La	1	50	n.	Valentine, Nebr	16	51	sw.
New York, N. Y	10	54	nw.	Do	27	66	sw.
North Head, Wash	3	72	se.				